

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
31 March 2005 (31.03.2005)

PCT

(10) International Publication Number
WO 2005/029169 A1

(51) International Patent Classification⁷: **G02F 1/1335**,
1/1362, G02B 5/02

(21) International Application Number:
PCT/IB2004/051784

(22) International Filing Date:
17 September 2004 (17.09.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
PCT/IB03/04248
22 September 2003 (22.09.2003) IB

(71) Applicant (for all designated States except US): **KONINKLIJKE PHILIPS ELECTRONICS N.V.** [NL/NL];
Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **TANAKA, Hideo**
[JP/JP]; c/o Philips Japan, Ltd., Philips Bldg., 2-13-37
Kohnan, Minato-ku, Tokyo 108-8507 (JP).

(74) Agents: **TSUGARU, Susumu et al.**; c/o Philips Japan,
Ltd., Philips Bldg., 2-13-37, Kohnan, Minato-ku, Tokyo
108-8507 (JP).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

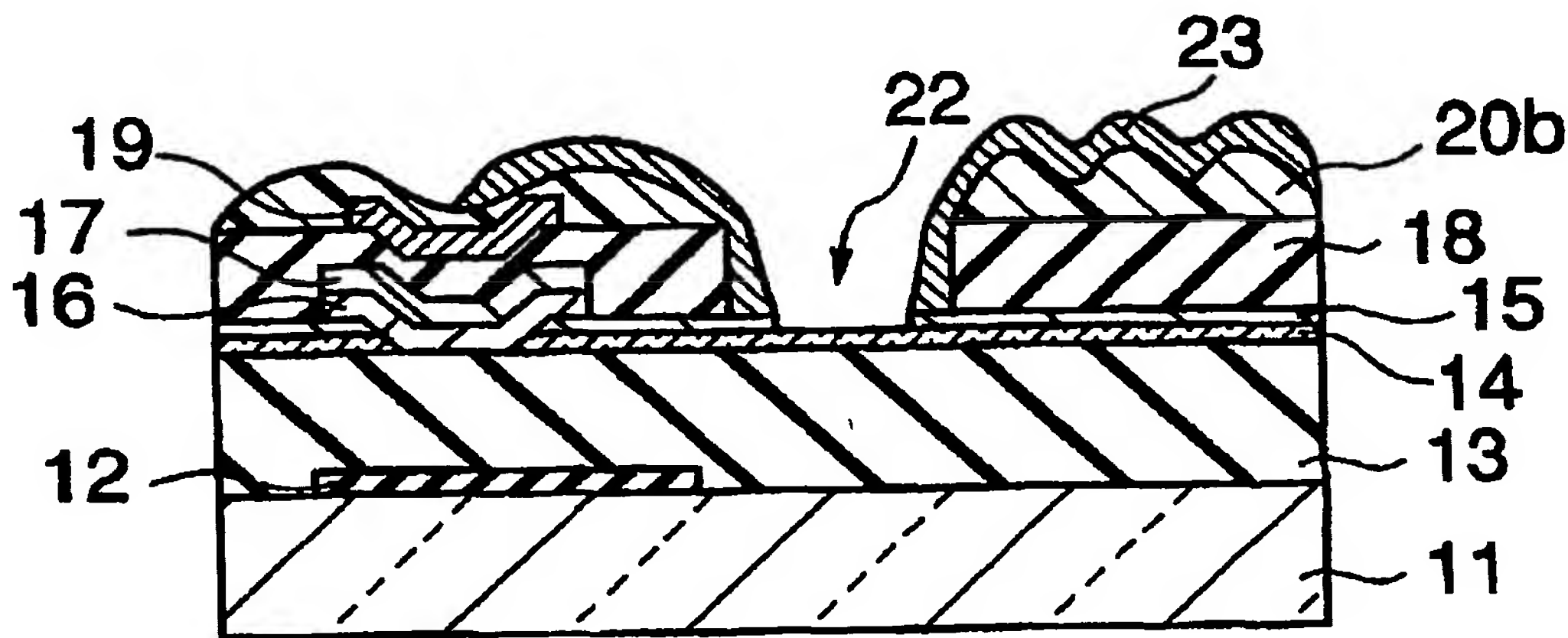
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD OF MANUFACTURING LIQUID CRYSTAL DISPLAY DEVICE



(57) Abstract: A method of the present invention includes the steps of forming an organic material film having projections and depressions, using a photo-embossing material, on an insulating film on an underlying electrode in a thin-film transistor of an active-matrix liquid crystal display device; exposing the insulating film in a contact-hole-forming-area by reducing a thickness of the organic material film by a dry etching to said organic material film; forming a contact hole and exposing the underlying by a dry etching to the exposed insulating film; and contacting the exposed underlying electrode with a reflective electrode by forming the reflective electrode on the resulting structure.

WO 2005/029169 A1